

Abstract Submitted  
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**Removal of Actinides and Lanthanides from Aqueous Solution by DTPA-Functionalized Magnetic Nanosorbents** HUIJIN ZHANG, University of Idaho, ROCKLAN MCDOWELL, LEIGH MARTIN, Idaho National Laboratory, YOU QIANG, University of Idaho — Diethylenetriamine pentaacetic acid (DTPA) functionalized magnetic nanosorbents have been synthesized and investigated for the removal of actinides and lanthanides from aqueous solutions in our laboratory. Various factors influencing metal sorption efficiency such as contact time, solution pH, and ionic radius of metal ions were studied. The sorption process reached saturation within 30 min of contact. For actinides, the oxidation states of metal ions had great effect on the chelating efficiency, which can be utilized to improve the separation selectivity. Displacement phenomena were observed between the heavier and lighter trivalent lanthanides (Ln(III)) that were co-existing in solution. The Ln(III) interaction with DTPA-functionalized magnetic nanosorbent followed the pseudo-second-order kinetics with a correlation coefficient extremely high and close to unity. The order of affinity of Ln(III) to DTPA functionalized magnetic nanosorbents perfectly followed the corresponding stability constants between Ln(III) and non-immobilized DTPA.

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